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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of San Diego Gas & Electric Company (U 902E) for Approval of SB 350 Transportation Electrification Proposals.	Application 17-01-020 (Filed January 20, 2017)
And Related Matters.	Application 17-01-021 Application 17-01-022

INTERIM REPORT OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E) ON PRIORITY REVIEW PROJECTS PURSUANT TO DECISION NO. 18-01-024

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Attorney for
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Dated: January 31, 2019

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Pursuant to Ordering Paragraph 34 of Decision No. 18-01-024, Pacific Gas and Electric Company provides its interim report for each of its approved Priority Review Projects. The interim report is attached as the Appendix to this pleading.

Respectfully submitted,

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By: */s/ Christopher J. Warner*
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Pacific Gas and Electric Company

SB 350 Priority Review Projects

Interim Report (1/2018-12/2018)

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A. School Bus Renewable Integration Pilot

1. Project Description and Background

Project Goals

In the School Bus Renewables Integration pilot, Pacific Gas & Electric (PG&E) is partnering with Pittsburg Unified School District (PUSD) to install utility-side (to-the-meter or TtM) and customer-side (behind-the-meter or BtM) infrastructure for nine electric school bus chargers (Clipper Creek CS100) at Pittsburg's administrative offices and bus depot. The school district is simultaneously (outside of this pilot) installing approximately 200 kilowatts (KW) of distributed onsite generation consisting of vertical wind turbines and experimental solar panels (that allow green light through, to enable plant growth) that are sized to the onsite administrative offices.

The goals of the pilot are:

1. Reduce the Total Cost of Ownership (TCO) of electric buses for school districts by:
    a. Minimizing infrastructure costs;
    b. Minimizing fuel costs - Managing charging to reduce electric usage during expensive, peak times.
2. Inform how medium and heavy-duty fleet vehicles can act as distributed energy resources during periods of high renewable penetration by testing incentive mechanisms for compensating fleet operators to adapt charging schedules to align with renewable generation.

This project also includes a charge management vendor, Liberty Access Technologies (Liberty Plugins) as well as software platform vendor, Olivine, Inc (Olivine).

PUSD has contracted with Pacific Energy Metro (PEM) to design and install the onsite renewables.

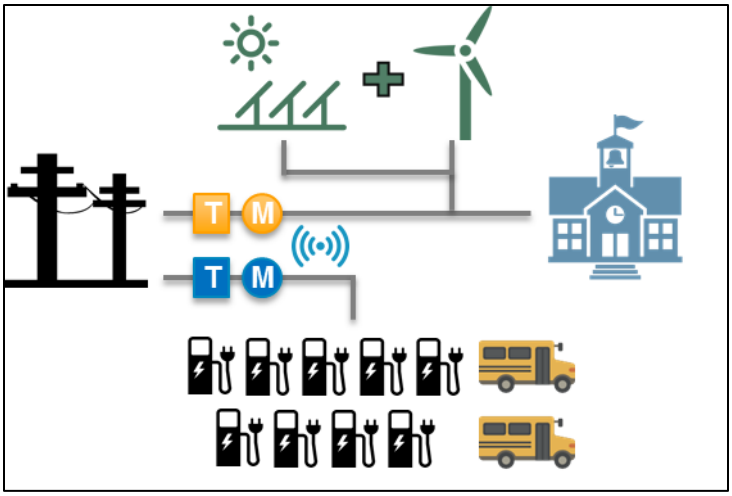

Figure 1: Diagram of PUSD BtM Energy Infrastructure

Procedural/Regulatory history

After the approval of the SB 350 Priority Review projects, there has been no additional regulatory or procedural history associated with the School Bus Renewables Integration pilot.

Implementation Timeline and Key Project Milestones

After a period of customer acquisition, PG&E began seriously discussing this pilot with PUSD in April 2018. The parties signed contracts in June 2018 after securing school board approval. Project engineering and design began after contract approval with construction commencing in September 2018.The site became operational on January 12, 2019.

Summary of Project Milestones: [1]

- Site Enrollment: June 2018
- Design: September 2018
- Construction: January 2019
- Commissioning: February 2019

Description of Equipment and Installation Services

The section below describes the equipment used and vendors selected to install the charging equipment as part of this pilot project.

[1] Proposed construction completion was scheduled for November 2018. Due to resource needs for emergency response and restoration related to the November 2018 camp fire, construction completion and charger commissioning was delayed two months to January 12, 2019.

Engineering

- Primoris Services Corporation (PSC) is responsible for all equipment installs, Engineering, Procurement and Construction (EPC). They were selected via a direct award to Diverse Business Enterprises (DBE) contractors working on PG&E Electric Vehicle Programs.

Construction and Materials

- The meter and distribution equipment were procured by Industrial Electric Manufacturing (IEM), as a subcontractor to PSC. All equipment was procured through OneSource, with approved vendors for TtM and BtM construction.

Charging Equipment & Load Management

- The load management system, Liberty Plugins, and chargers, Clipper Creek, were procured and are owned by PUSD. PUSD was reimbursed at full price by PG&E.
- Olivine, Inc., provided software-as-a-service integrating with Liberty Plugins to provide an energy optimization platform. Olivine and Liberty Plugins were selected based on requirements determined by PUSD and PG&E. Nine solutions were considered against the requirements.
    - Olivine Inc. was selected due to experience integrating with PG&E's Excess Supply pilot, OpenADR2.0b experience (as a Demand Response Platform Provider), cost considerations and incorporation of user interface components desired by PUSD (e.g. a web widget, etc.)
    - Liberty Plugins was selected due to their OpenADR2.0b certification, cost considerations and experience working on medium-duty and heavy-duty vehicle projects with Clipper Creek Chargers.

Description of Project Status

The PUSD School Bus Renewables Integration pilot is currently operational. PG&E is now entering one year of testing with Olivine and Liberty Plugins. The testing will take place throughout 2019 and is phased based on Table 1 below.

Table 1: PUSD Testing Plan

Phase	Start	End
Test Phase 1: Static Charging	19-Jan	19-Feb
Test Phase 2: XSP[2] Integration	19-Mar	19-Apr
Test Phase 3: Renewables Self-Consumption	19-Apr	19-Oct
Test Phase 4: School Bus Telematics Integration	19-Jul	19-Oct

[2] PG&E's Excess Supply Pilot, administered by Olivine: https://olivineinc.com/services/our-work/xsp/

Ongoing system test	19-Oct	19-Dec

- **Phase 0 – Baseline**: In line with expected charger installation and commissioning, the buses will begin charging when plugged in. During this early phase, Olivine will complete a bus energy needs analysis that will be an input to baseline metrics to measure against and into the optimization of the subsequent charge schedules.
- **Phase A - Static Charging:** This phase will begin by testing the systems integrations developed between Olivine and Liberty Plugins. Olivine's software platform will implement bus charging using static schedules. During this phase, the primary goal is to ensure that the bus energy needs are met while minimizing electricity charges, and to further analyze the opportunity for charge flexibility in the real-world environment. In this phase, the costs and the customer/societal GHG impacts will be measured against the baseline and for comparison with each of the later phases.
- **Phase B – Excess Supply Pilot (XSP) Participation:** This phase adds Demand Response event-based responsiveness to excess wholesale supply, shifting load from the static schedules of Phase 1.
- **Phase C - Onsite self-consumption optimization:** This phase focuses on self-consumption as an optimization to the static charging schedules. The time interval of optimization will be determined during system analysis, with a likely target of a 5-minute optimization interval. Note that XSP participation may continue in this phase, if feasible.
- **Phase D– School Bus Telematics Integration:** This phase adds smart charging optimization for any of the buses providing telematics, and includes self-consumption described in Phase C. Participation in XSP will be included at certain times during this phase to compare against the baseline in phase 1.

2. Project participants

Customer Outreach and Engagement

PG&E used a variety of outreach and engagement methods to determine suitable partners for this pilot. The two main resources PG&E engaged were:

- **PG&E's Business Energy Solutions Team:** PG&E has several customer service representatives who work with schools throughout the service territory on various energy programs. Using these resources, information was gathered regarding school districts who were in the process of electrifying their fleet or had recently considered or executed on requesting grant funding for vehicles.
- **A-Z Bus Sales:** A-Z Bus Sales is a California School Bus sales company. PG&E engaged A-Z Bus Sales as well as several other school bus retrofitting and sales companies (e.g. Adomani, Inc.) to understand school demand for electric buses in PG&E's territory. These companies shared information, with district buy-in, regarding school districts they had recently sold buses to, or had been in discussions to sell buses to.

Given the regulatory requirement to have chargers operational by January 2019, PG&E aimed to partner with a district that already had an electric bus or was far in the process of receiving grant funding and purchasing an electric bus. By engaging both internal and external partners, PG&E was able to get a sense of which districts met these criteria. Once a short-list of potential customers was obtained, PG&E used the evaluation criteria outlined in Figure 2 below to select a partner.

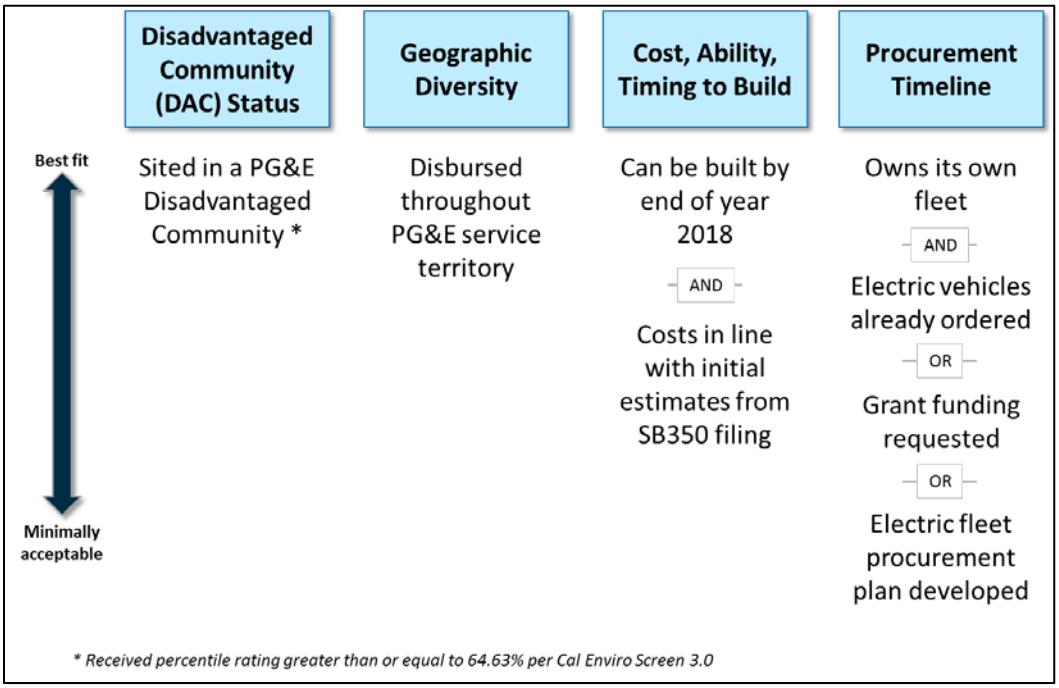

Figure 2: Evaluation Criteria for PRP Sites/Customers

By April 2018, PG&E determined that PUSD was a strong partner for this pilot, for the following reasons:

- PUSD is in a DAC;
- PUSD is in a region that was geographically distinct from the other Priority Review Projects, enabling an equitable locational spread of funding;
- PUSD had one electric bus on site at the time of site enrollment and signaled they would be interested in purchasing additional buses with the opportunity to install charging equipment as part of this pilot;
- PUSD was designing and installing onsite renewables, providing a richer test environment for this pilot, and;
- PUSD is a very engaged partner, committed to trialing new, sustainable programs, and was eager to partner with PG&E.

Description of Customers and Sites

Pittsburg Unified School District (PUSD) is one of 130 school districts across the nation recognized for creating opportunities for traditionally underrepresented students. These efforts were recognized in 2016 when PUSD was awarded the College Board's Gaston Caperton Opportunity Honor Roll award for expanding access to college. The district is comprised of eight elementary schools, three junior high schools, one comprehensive high school, one alternative education high school, an adult school, independent study options, and a preschool program. The school district serves more than 11,500 students and is in the San Francisco Bay Area.

PG&E installed nine Clipper Creek CS-100 chargers to serve both the bus depot and administration facilities. The facilities include a large industrial grade freezer, warehouse space, a mechanic shop and administrative space. PUSD has recently installed multiple Level 2 EV charging stations at this site for the district's light-duty fleet.

The CS100 chargers are not accessible to the public. They are behind a locked gate; only PUSD staff can access these chargers. PUSD bus drivers can access the chargers, but there is no payment or payment method required.

PUSD currently has two type-C eLion school buses on site and plans to add an additional seven vehicles across four manufacturers: Lion Electric Company, GreenPower, BlueBird Corporation and TransTech Bus. Manufacturer provided E-bus specs are presented in the table below. Since many of the buses are still planned purchases, exact specifications may not yet be known. In these cases, the table is marked "N/A."

Table 2: Relevant Electric Bus Specifications

	Lion Electric Co.	GreenPower Bus	BlueBird Corporation	TransTech
Planned Quantity in PUSD Fleet	2 (delivered)	2	2	3
Model	eLion C	Synapse 73	N/A	N/A
Battery Size (kWh)	132	100-200	166	106
Range (Miles)	100	75-140	120	75
Charging Protocol	AC-19.2kW-J1772	N/A	AC-19.2kW-J1772	J1772

A map of the site with charger locations can be seen in Figure 3.

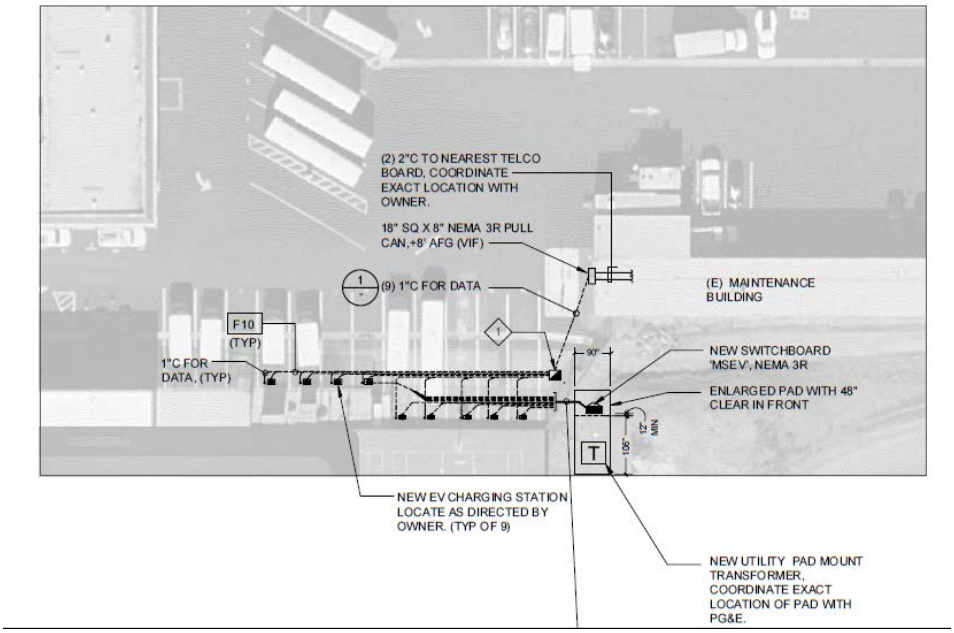

Figure 3: Map of PUSD Site

PUSD previously installed four Level 2 GE Chargers with EVgo, which are used to charge light-duty electric vehicles belonging to the district fleet, as well as employee electric vehicles. These chargers connect to the administration building and are included in the overall administration building load.

Barriers to Participation

PG&E considered 25 school districts as partners for this pilot project. After initial screening, 11 of these schools were found to be in DACs. Considering school district interest, fleet ownership (some districts use public bus fleets, like AC Transit in Oakland, CA), district electric bus plans, and district/bus route location, PG&E selected PUSD to partner.

Of the 25 districts initially considered, 96% were unable to participate. The following is a breakdown and description of barriers to participation:

- 56% - Not in a DAC: A number of identified school districts were unable to participate due to fact that they were not located in a DAC.
- 16% - No electric buses, fleet ownership or near-term plans to purchase electric buses: Several districts were interested in purchasing electric buses but did not have funding secured through their school board or via grants at the time of site enrollment, rendering them unable to participate due to the time requirements of the PRPs.

- 16% - Rural school district, cost limitations or limited interest: Several districts who initially showed interest were unable to get approval from boards/leadership or were found to be in rural areas leading to cost considerations due to the to-the-meter infrastructure design and upgrades that would be required.
- 8% - Co-located with other PRP or Electric Vehicle Charge Network (EVCN) projects: 2 school districts (~8%) were in the same county as another PG&E PRP (San Joaquin) or EVCN project (Merced). To equitably distribute electric vehicle funding, these districts were removed from the down-select list.

Disadvantaged Community Participation

DAC participation was the first filter used to select a partner for this project. PUSD is in a DACand its bus routes serve DACs. [3]

3. Costs

Program Budget

Table 3: School Bus Pilot Actual and Proposed Costs

Project Cost Category	2018 Actual	2019 Projected	2020 Projected	Totals
Capital Cost				
Make Ready	$ 83,734	$ 173,466	$ -	$ 257,200
Project Management	$ 175,912	$ 74,088	$ -	$ 250,000
Total Capital	$ 259,646	$ 247,554	$ -	$ 507,200
Expense Cost				
Charge Management	$ 50,209	$ 519,791	$ 30,000	$ 600,000
Project Management	$ 50,684	$ 449,316	$ -	$ 500,000
Measurement & Evaluation	$ -	$ 100,000	$ -	$ 100,000
Outreach and Engagement	$ -	$ 100,000	$ -	$ 100,000
Billing &Technical Support	$ 2,419	$ 247,581	$ -	$ 250,000
Charger Incentives	$ 25,696	$ -	$ -	$ 25,696
Load Shift Incentive	$ -	$ 92,300	$ -	$ 92,300
Make Ready O&M	$ -	$ -	$ 823	$ 823
Total Expense	$ 129,008	$ 1,508,988		$ 1,667,996
Total Cost	**$ 388,654**	**$ 1,756,542**	**$ -**	**$ 2,175,196**

Description of variances or deviations from forecasted costs

Full project costs have not been recorded at this time. When considering recorded costs to date, there are minor deviations from forecast costs. Specifically, there is a deviation of -$34,304 from the initial budget due to the charger incentives costing less than forecast. Since PUSD selected Clipper Creek CS-100 (instead of a networked charger), the total cost of all nine chargers was approximately half what was expected.

[3] *Received percentile rating greater than or equal to 64.63% per Cal Enviro Screen 3.0*

Description of Leveraged Funding Sources

PUSD has leveraged and plans to continue to leverage grant funding for all nine buses.

- **Leveraged Funding Used to Date:** PUSD leveraged $250,000 of funding for the purchase of two type-C eLion buses from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP).
- **Leverage Funding Received but Not Yet Used**: PUSD has $400,000 of grant funding from the Bay Area Air Quality Management District (BAAQMD) that has been allocated to purchase three additional buses. PUSD must meet environmental requirements pertaining to existing, in-use diesel buses before they can use this funding to purchase new electric buses. They expect to meet these requirements and purchase three buses in 2019.
- **Expected Future Funding:** PUSD continues to remain abreast of potential vehicle grant opportunities to grow their fleet from five to nine buses by 2020.

4. Safety

Summary of Relevant Safety Requirements

When developing, engineering, constructing and testing the PUSD project, the following safety requirements were determined and withheld throughout the project, to date:

- The Contractor is required to provide a Site-Specific Safety Plan.
- Contractors are required to follow all OSHA safety requirements and all requirements outlined in the SB 350 Safety Check-List before, during, and after construction.
- Contractors are required to follow all PG&E safety requirements before, during, and after construction.
- PUSD is responsible for providing all disclosures, including but not limited to hazardous materials, located at the site of the installation.
- PUSD has a duty to promptly notify PG&E when PUSD becomes aware of any unsafe, inoperable or damaged equipment.
- All parties shall comply with all applicable federal, state, and local statutes, rules, regulations, laws, orders and decisions that relate to or govern its participation in the SB 350 Priority Review Projects and/or PUSD's interactions with customers in connection with the SB 350 Priority Review Projects

There have not been any safety concerns on this project. PG&E did record that temporary fencing be provided while parties were inactive construction to secure the yard from unauthorized personnel.

5. Lessons Learned

Table 4: Lessons learned for the PUSD Pilot

Category	Issue	Lesson Learned/Recommendation
Grid Integration	There were no software tools that fit all desired requirements for the project.	If OpenADR is required, do due diligence to ensure suppliers are certified. Installing networked chargers improve availability.
Grid Integration	Opportunities to receive incentives to further manage charging (e.g. DR) exist but may have limited applicability due to vehicle duty cycles.	Build a solution first that meets operational needs and then consider where additional flexibility can meet grid needs.
Facility Energy Management	Several customers are aiming to create broader clean energy/sustainability plans, including solar, storage, and EVs. As customers build multiple projects that impact economics (e.g. NEM adders, EV rates), it becomes increasingly complex for the customer to understand ROI.	Customers may need more guidance on how to minimize the costs of charging, particularly if they are adding onsite generation simultaneously. Creating easy to understand rate guidance is helpful. PG&E should align stakeholders internally to help all potential questions related to onsite programs, like energy efficiency, rates, and renewables interconnection.
Charger & Load Management Selection Process	There are many Level 2 charging options (chargers and load management tools) available to customers. It can be hard to confirm a selected set of chargers/load management vendors without distinct requirements and milestones.	Customers may need more guidance and advice on what charging equipment is best suited to their needs. Create a process to introduce options and down select with the customer. Understand both technical needs, as well as upfront and ongoing (expense) cost considerations early in the process to help guide selections and provide time in the schedule for decision making.
Customer Acquisition	Schools are cautiously eager to electrify. They tend to plan to convert a few school buses at a time based on fleet turnover.	Work with customers to determine what their medium/longer term plans are to be cost-effective with TtM upgrades and labor expense.
Customer Acquisition	Customers may purchase vehicles without planning infrastructure needs.	Find ways to couple PG&E infrastructure offerings (e.g. EV Fleet Program) with bus grant opportunities, to ensure customers can efficiently and cost-effectively charge vehicles when they arrive on site.
Process	There was not enough time allocated to internal planning with Distribution Planning at the beginning of the project, leading to some downstream rework that could have been avoided.	Create a process for PG&E's EV Fleet program where Distribution Planning is involved in the early planning stages for larger fleet sites that can have large load impacts.
Process	Terms and Conditions are typically handed over to the host at the beginning of the project, but the final easement document cannot be created until the design phase.	Design time and flexibility into design review for easement approvals. Things to consider include board presentations and sign off time.

B. Medium Heavy-Duty Transit Pilot

1. Project Description and Background

Project Goals

In the medium heavy-duty transit pilot, PG&E is partnering with San Joaquin Regional Transit District (SJRTD) to install five 60 KW DC fast chargers at the agency's bus depot. These chargers will be equipped with charge management software and used for overnight charging. PG&E will also install battery storage at a bus transfer station where SJRTD has deployed en-route extreme-fast charging to reduce the demand charges associated with such high-speed chargers. In total, SJRTD will have three electric bus charging sites, each with a differing charging capability, to charge their fleet of 17 electric buses.

The goals of the pilot are:

1.) Reduce the TCO using three unique charging models
   a. Overnight charging at the depot location using DC fast chargers
   b. Extreme fast charging at a transfer station paired with energy storage
   c. Extreme fast charging at a transfer station paired with charge management software
2.) Inform how transit agencies can implement transportation electrification and the future deployment of EV Fleet, PG&E's medium and heavy-duty fleet infrastructure program

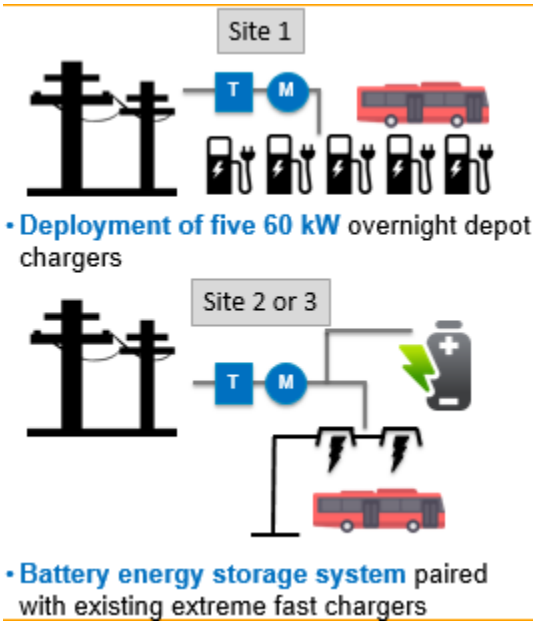

Figure 4: Diagram of SJRTD Depot and Overhead Charger Locations

Procedural/Regulatory History

After the approval of the SB 350 Priority Review projects, there has been no additional regulatory or procedural history associated with the Medium and Heavy-Duty Transit pilot.

Implementation timeline and milestones

The project was targeted to be constructed in January 2019 to be able to collect one year of data to evaluate the pilot. However, changes were made to the design to mitigate a conflict with an existing easement on the property. These changes pushed back the construction timeline to be completed in February 2019.

Proposed Milestones:

- Site Enrollment: June 2018
- Design:
  - Depot Chargers- January 2019
  - Battery Storage- March 2019
- Construction:
  - Depot Chargers- February 2019
  - Battery Storage- May 2019
- Commissioning:
  - Depot Chargers- March 2019
  - Battery Storage- June 2019

Description of Equipment and Installation

The section below describes the equipment used and vendors selected to install the charging equipment as part of this pilot project.

Engineering, Construction and Materials

- ARB Inc. is responsible for all equipment installs, Engineering, Procurement and Construction (EPC). They were selected via a competitive procurement process by PG&E. All construction materials and associated materials required for the depot site construction and installation will be procured by the contractor, except for the charging equipment which was procured and owned by SJRTD. PG&E reimbursed SJRTD for the charging equipment at full price.

Charging Equipment

- SJRTD is responsible for procuring the five DCFC (60 kW) Proterra Depot chargers with charge management software. SJRTD approached several vendors that provide charging equipment for their specific use case; an exploration of the market showed that there were few vendors able to provide charging equipment to meet their needs. Given the existing fleet of 12 Proterra Buses and an additional 5 Proterra buses expected to be delivered at the

end of 2018, RTD decided to award a sole-source contract to Proterra for their depot chargers to ensure there would be no compatibility issues.

Load Management

- To reduce RTD's cost to operate electric buses, two load management strategies were designed into the pilot via Proterra's load management platform. For the depot site, load management software will be used to optimize charging and reduce demand charges under SJRTD's existing rate plan (A-10 TOU).

  For the existing downtown transfer site and the new transfer site, load management software will be used to reduce the demand chargers by capping the maximum power the charger can draw to 300 KW. At the new transfer site load management will be facilitated by both using the load management software and installing a battery to enable load shifting and shaving.

Description of Project Status

Customer acquisition was completed in Q2 2018. The design stage of the project was completed the week of 1/15/19 with construction scheduled to begin in first half of February. Construction was delayed due to a change in the To-The-Meter Design (TtM). The initial design required PG&E to request an easement on the adjacent property. It was determined that requesting this easement would add a significant amount of time to the construction schedule. As a result, PG&E and SJRTD decided the best approach was to have a re-design of the TtM component of the project so that the new service line would be located exclusively on SJRTD's property. This change to the design resulted in pushing the construction schedule out to February 2019.

2. Project participants

Customer Outreach and Engagement

During development of PG&E's EV Fleet program, PG&E created a list of over 50 transit agencies within PG&E's service territory and had spoken with several of these agencies to track electric bus purchasing activity. From this broader list, PG&E used the criteria outlined in Figure 2: Evaluation Criteria for PRP Sites/Customers, to create a short list of transit agencies for the pilot.

PG&E focused its efforts on selecting a partner whose depot was in a DAC and where a majority of the routes would serve DACs. In addition, PG&E aimed to partner with an agency who had already purchased electric buses to meet the regulatory requirement to have chargers operational by January 2019. By early February 2018, PG&E had identified SJRTD as an ideal candidate for the pilot for the following reasons:

- SJRTD's depot is in a DAC;
- All SJRTD's routes serve DAC;
- SJRTD is in a region that was geographically distinct from the other Priority Review Projects, enabling an equitable locational spread of funding;

- SJRTD had an existing fleet of 12 electric buses on site and had placed an order for an additional five electric buses expected to be delivered at the end of 2018; however, SJRTD had not yet determined the best charging option for the additional buses;
- SJRTD is a leader in the clean transit space, having announced a goal to be 100% electric by 2025.

Description of Customers and Sites

SJRTD provides public transit services in the Stockton Metropolitan area as well as intercity, interregional and rural transit services for San Joaquin County. It operates 60 routes across its service area of 1,426 square miles and has a service area population of 755,645. The total annual number of trips taken on their buses is 4,047,559.

SJRTD owns 17 electric buses all manufactured by Proterra. Table 5 below outlines relevant bus specifications for each of the buses operating or planned to operate in SJRTD's service territory.

Table 5: Relevant Electric Bus Specifications

Manufacturer	Proterra		
Planned Quantity in SJRTD Fleet	2	10	5
Model	BE35	Catalyst Fast Charge	Catalyst E2 Long Range Buses
Battery Size (kWh)	78	105	440
Range (Miles)	30-40	75-140	151
Charging Protocol	DC Roof Mounted Pantograph	DC Roof Mounted Pantograph	DC SAE Combo

The pilot is focused on three sites owned and operated by SJRTD: a depot site; an existing downtown transfer station; and a new transfer station currently under construction. None of SJRTD's chargers are publicly available and are exclusively used to charge SJRTD's EV bus fleet.

Downtown Transfer Station:

SJRTD operates 2 overhead opportunity chargers manufactured by Proterra at their downtown transfer station site. SJRTD is constructing a second transfer station site that will also include 2 overhead opportunity chargers.

Figure 5 below shows the existing overhead opportunity chargers leveraging the roof-mounted pantograph technology.

Figure 5: Photo of SJRTD Overhead Chargers

Depot Site:

All busses operated by SJRTD are stored and maintained at the depot site when not in service. The 5 (60 kW) depot chargers are being installed to support the charging of 5 additional buses that arrived at SJRTD in late 2018. These new buses have an extended range that do not require frequent charging. The buses acquired before 2018 in Table 5 above have shorter ranges and require frequent charging 9-12 times a day to maintain a state of charge to serve their routes.

Figure 6 below describes the location of the five DCFC (60kW) chargers that will be installed at the depot location.

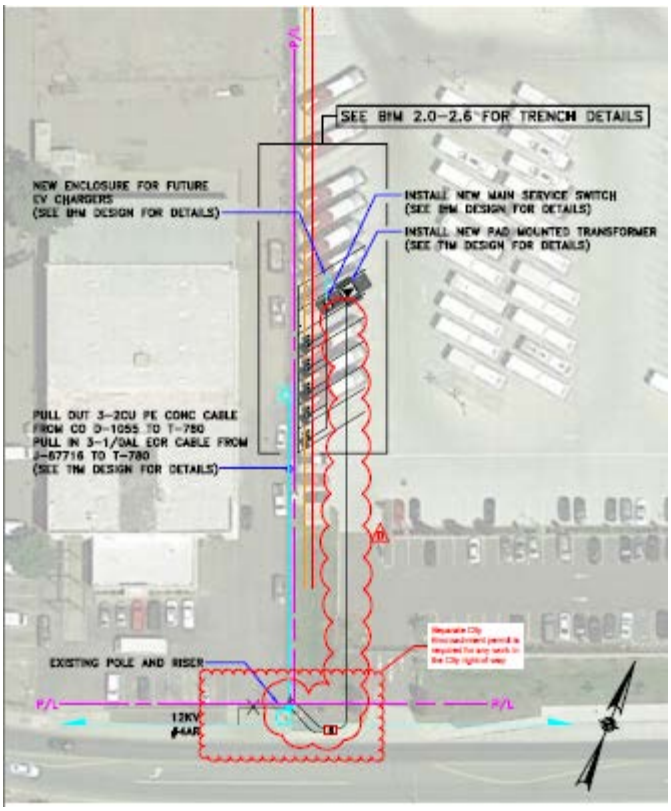

Figure 6: Location of Proposed Depot Chargers

Barriers to participation

There were two main barriers to participation in the Medium and Heavy-Duty Transit pilot. The first was whether the transit agency was in a DAC. Of the over 50 transit agencies evaluated by PG&E, only a handful of agencies had depots located in a DAC. Several agencies within the greater Bay Area expressed interest in the pilot and operated some routes in DACs, but their depots were located elsewhere, making them ineligible per the regulatory requirements. The second barrier was whether the transit agency acquired or had plans to acquire electric buses by the time the pilot was fully constructed. SJRTD met both criteria, as they had already acquired 12 electric buses and had 5 additional buses that would be delivered by the end of 2018.

Disadvantaged Community Participation

DAC participation was the first filter used to select a partner for this project. SJRTD's depot, where buses are stored and maintained, is in a DAC and all routes served were in a DAC.

3. Costs

Program Budget

Table 6: Medium/Heavy-Duty Transit Pilot Budget shown with 2018 Actuals

Project Cost Category	2018 Actual	2019 Projected	2020 Projected	Totals
Capital Cost				
Utility-Side Make-Ready	$ -	$ 370,000		$ 370,000
Customer-Side Make-Ready	$ -	$ 210,000		$ 210,000
Project Management	$ 11,876	$ 238,124		$ 250,000
Total Capital	$ 11,876	$ 818,124		$ 830,000
Expense Cost				
Energy Storage/Charge Management		$ 900,000		$ 900,000
Internal Project Management	$ 92,750	$ 32,250		$ 125,000
Purchased & Self Developed Software	$ -			$ -
Measurement & Evaluation	$ -	$ 100,000		$ 100,000
Outreach and Engagement	$ -	$ 100,000		$ 100,000
Charger Incentives	$ 285,280			$ 285,280
Make Ready O&M	$ -		$ 1,209	$ 1,209
Total Expense	$ 378,030	$ 1,132,250	$ 1,209	$ 1,510,280
Total Cost	**$ 389,906**	**$ 1,950,374**		**$ 2,340,280**

Provide Description of Variances

Full project costs have not been recorded at this time. When considering recorded costs to date, there are deviations from forecast costs. Specifically, there is a deviation of -$614,720 from the initial budget due to the charger incentives and load managemnt costing than forecast. This savings was a result of SJRTD electing to install five chargers instead of the 12 forecasted. SJRTD was also able to reduce the cost of the load management in exchange for piloting Proterra's software

Description of Leveraged Funding

SJRTD has received over $16 million funding from federal and state agencies to purchase each of their buses. Specifically, SJRTD has received funding from the following agencies or programs:

- California Hybrid and Zero-Emission Truck and Bus Voucher Program (HVIP) (California Air Resources Board)
- Section 5312 Low and No Emissions Bus Deployment Program (Federal Transit Administration)
- Congestion Mitigation and Air Quality Improvement (CMAQ) Program (Federal Highway Administration)
- Heavy Duty Truck and Bus Program (California Air Resources Board)
- State Transit Assistance Program (CA State Transit Development Act: Diesel Fuel Tax)
- Transit and Intercity Rail Capital Program (CA State Greenhouse Gas Reduction Fund)
- Enhanced Transportation Strategies-Public Benefit Grant (San Joaquin Valley Air Pollution Control District)

- Measure K Local Sales Transportation Tax (San Joaquin Council of Governments)
- Alternative and Renewable Fuel and Vehicle Technology Program (California Energy Commission)

4. Safety

Summary of relevant safety requirements

When developing, engineering, constructing and testing the SJRTD project, the following safety requirements were determined. While construction has not yet begun, ARB, in consultation with PG&E and SJRTD, will do the following:

- The Contractor is required to provide a Site-Specific Safety Plan.
- Contractors are required to follow all OSHA safety requirements and all requirements outlined in the SB 350 Safety Check-List before, during, and after construction.
- Contractors are required to follow all PG&E safety requirements before, during, and after construction.
- SJRTD is responsible for providing all disclosures, including but not limited to hazardous materials, located at the site of the installation.
- SJRTD has a duty to promptly notify PG&E when SJRTD becomes aware of any unsafe, inoperable or damaged equipment.
- All parties shall comply with all applicable federal, state, and local statutes, rules, regulations, laws, orders and decisions that relate to or govern its participation in the SB 350 Priority Review Projects and/or SJRTD's interactions with customers in connection with the SB 350 Priority Review Projects

The depot construction has not started yet and there have been no safety issues to date during implementation of the charge management software at the existing downtown transfer site.

5. Lessons Learned

Table 7: Lessons learned for the SJRTD Pilot

Category	Issue	Lesson Learned/Recommendation
Charging Equipment	EV charger manufacturers are still developing software functionality for the Transit sector	Worked with Proterra to accelerate software development and deployment of load management on overhead chargers. Continue to work with OEM manufacturers to accelerate the deployment of EV chargers and associated software.
Charging Equipment	Long lead-time for EV chargers for the transit sector, typically 4-6 months.	The delivery of the depot chargers was accelerated due to prioritization by the manufacturer. Establish realistic delivery timeframes for EV charging equipment and incorporate this into the construction schedule.
Energy Management	Demand Charges are complex and add volatility to fuel cost	Charge management software was implemented and reduced the demand charges. Charge management software was deployed and now keeps the demand usage below 300

	compared to gasoline/diesel.	KW. This has resulted in reducing RTDs energy cost by approximately $2,000 per month with no impact to operations. Chargers should be deployed with charge management software. See Figure 7 below for more detail.
Customer Knowledge/Confidence in Technology	Transit Agencies do not have a great deal of subject matter expertise in EV charging and are concerned about the impact of new technology on ability to serve the public.	PG&E has worked closely with SJRTD and helped them with charger selection and infrastructure options. PG&E will focus on creating resources to educate Transit agencies on EV charging and infrastructure options. Develop materials to show the reliability and equivalency of electric buses.

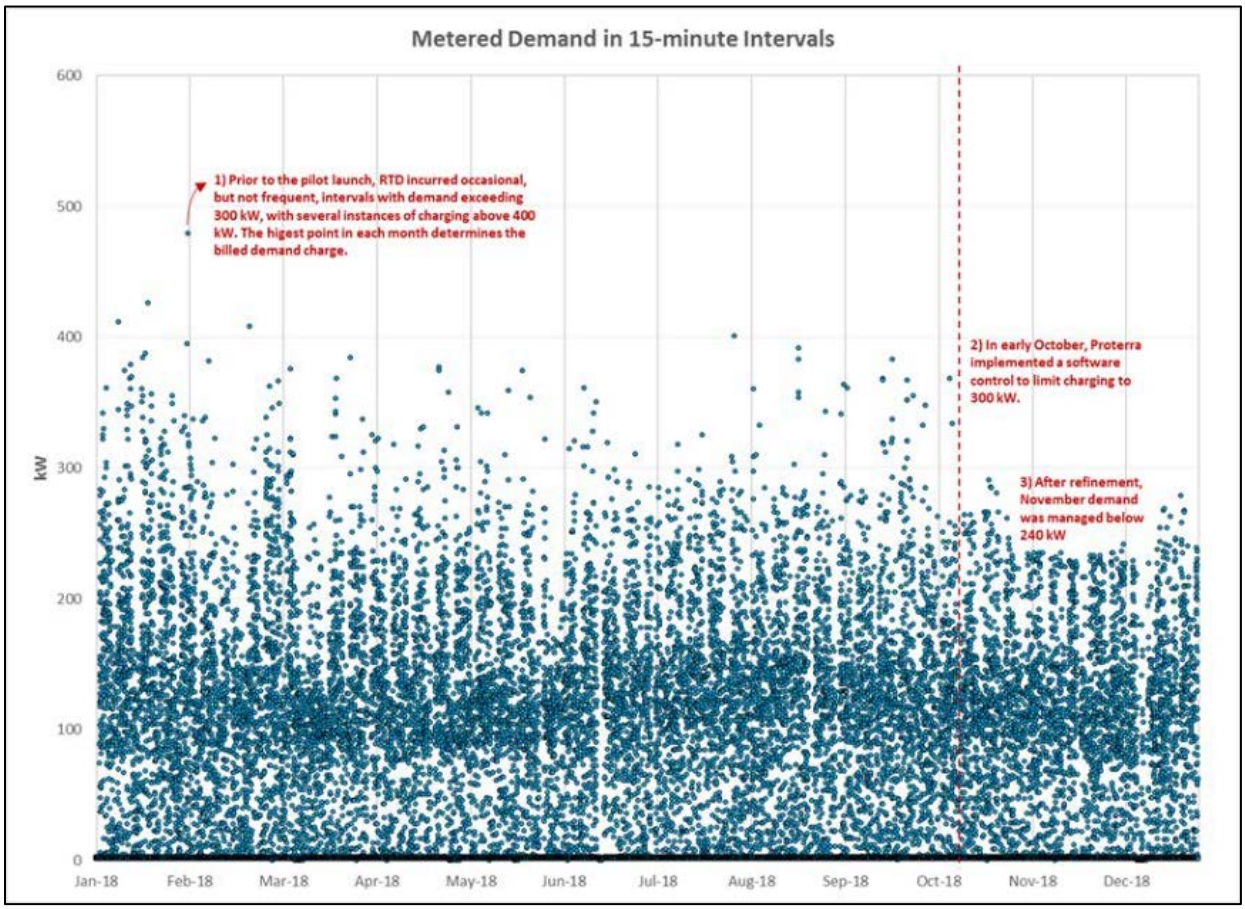

Figure 7: SJRTD Meter Demand of Overhead Chargers Pre/PostImplementation of Load Management

C. Idle Reduction Pilot

1) Project Description and Background

Project Goals

PG&E is working with Albertsons Companies LLC (Albertsons), a grocery company with locations across California for the Idle Reduction Technology pilot. The scope of the pilot is to install a total of 25 electric Transportation Refrigeration Unit (eTRU) ports, 15 of which are located at staging spaces and 10 at dock spaces across the food distribution center. The staging spaces are used to pre-cool the containers before they are positioned at the dock for loading perishable goods

The goals of this pilot are:

1. Reduce the TCO for eTRU in food distribution operations by:
    a. minimizing infrastructure cost;
    b. determine how to further reduce TCO by minimizing fuel costs without impacting business operations.
2. Develop learnings that can be syndicated to other distribution facilities in support of implementation of EV Fleet, PG&E's medium and heavy-duty fleet infrastructure program

Procedural/Regulatory history

PG&E received conditional approval of its Idle Reduction Technology Pilot and was directed to file a Tier 2 Advice Letter before beginning implementation. PG&E was asked to identify: (1) commitments from both truck stops and fleet operators; (2) PG&E's efforts to engage and educate these partners throughout the duration of the pilot; (3) how PG&E would design the pilot to collect the necessary data to inform future rate designs that would make these idle reduction technologies economically feasible; and (4) whether PG&E would support truck stop electrification, eTRU, or both. PG&E was also asked to present its project to the California Freight Advisory Committee (CFAC) and report any resulting feedback.

On April 27, 2018, PG&E filed Advice 5279-E detailing its Idle Reduction Technology Pilot plan. In addition to the above criteria, PG&E addressed market barriers limiting the adoption of eTRU and explained how its proposal would address such barriers.

The CPUC approved PG&E's Idle Reduction Technology Pilot on May 21, 2018.

Implementation Timeline and Key milestones

PG&E began the customer acquisition process after final approval of the Idle Reduction Technology Pilot at the end of May 2018. PG&E selected Albertson's to participate in the pilot in September 2018 with both parties entering into an agreement in October 2018. Project engineering and design began after contract approval.

Proposed Milestones[4]:

- Site Enrollment: October 2018
- Design: January 2019
- Construction: March 2019
- Commissioning: May 2019

Description of Equipment and Installation Services

Albertson's has elected to install the 25 eTRU ports off their existing electric infrastructure. As a result, PG&E will not own or operate any of the infrastructure installed as part of this pilot. Albertsons will be responsible for the procurement, construction and maintenance of all infrastructure installed in this pilot and PG&E will provide Albertsons a rebate once they have completed design, procurement of the EVSE charging equipment, and construction.

Engineering, Construction and Materials:

Albertsons has hired a construction design firm, Hansen-Rice, who is responsible for all EPC. Albertsons and their contractor are procuring all construction materials for the project.

Charging Equipment

An evaluation of available eTRU charging technology to meet their use conditions was conducted by Albertsons, their contractor and PG&E. During their evaluation of the available charging technology it was discovered that eTRU equipment was a nascent technology in comparison to charging equipment for light-duty and medium/heavy-duty electric vehicles. After their evaluation, Albertsons decided to procedure ports from SafeConnect. SafeConnect provides eTRU ports that met their needs of being a product with safety features that comply with the CPUC approved Safety Checklist.

Table 8: Description of eTRU Charging Equipment

Charger Type	Maximum Voltage Level	Power Level (KW)	Dispenser Type[5]	Proposed Number of Ports Installed

[4] Estimated timeline.

[5] There is not an existing plug standard like what has been developed in the light-duty EV sector (e.g. SAE J1772). However, SafeConnect meets the requirements of the Safety Checklist. Specifically, passing EVSE safety performance evaluation report performed by a Nationally Recognized Testing Lab (NRTL); when not connected, the vehicle inlet and the EVSE connector must be designed to prevent direct contact with any live components; the vehicle inlet and EVSE connector shall be free of sharp edges and potentially injurious protrusions; the coupler between the vehicle and the EVSE should avoid or mitigate any potentially hazardous conditions such as fires, electrical shock to users, or other personal injuries.

SafeConnect 480V Single Port	480 V	14-17 kW	Plug-in with six pin connectors	1
SafeConnect 480V Double Port	480 V	14-17 KW	Plug-in with six pin connectors	12

Description of Project Status

The design phase of this project has just been completed after the design was reviewed and approved by PG&E's registered professional engineers. Additionally, Albertsons placed purchase orders for their eTRU ports from vendor SafeConnect. Project construction is expected to begin in March 2019.

1. Project participants

Customer outreach and Engagement

PG&E relied heavily on its Business Energy Services representatives for leads on possible eTRU fleet owners/customers. PG&E also collaborated with the CARB which requires eTRU fleet owners to register their vehicles. Through this effort, PG&E was able to develop a short list of approximately twenty customers.

Unlike PG&E's other two infrastructure pilots, eTRU fleets are primarily owned by private enterprises. As a result, PG&E initially focused on selecting a small or medium business customer, ideally located in the Central Valley. Initial conversations indicated a high level of interest; unfortunately, PG&E found that small and medium business owners often did not have the resources to dedicate to scoping and implementing a pilot. As a result, PG&E had to quickly pivot towards a larger customer who expressed interest.

Similar to the previous pilots, PG&E's selection criteria focused on the criteria described in Figure 2: Evaluation Criteria for PRP Sites/Customers.

By September 2018, PG&E had identified Albertsons as its pilot customer for the following reasons:

- Albertsons' distribution center is in a DAC;
- Albertsons had an existing fleet of eTRUs that were utilizing diesel to fuel the eTRU due to a lack of charging infrastructure;
- Albertsons had the resources and the capability to meet the data collection requirements;
- Albertsons anticipated the need for up to 500 charging ports in the future, meaning lessons learned from the pilot could quickly inform and help scale future projects;

- Albertsons is a transmission-level customer and requested to build the charging equipment off their existing infrastructure, giving PG&E the opportunity to pilot the process for the EV Fleet rebate option.

Description of Customers and Sites

Albertsons is a large grocery company which is the parent company of Safeway and operates a food distribution service center facility in Tracy, CA. The facility is in and serves a DAC. The facility is 2.2 million square feet and has 313 dock spaces and over 400 staging spaces.

Figure 8 below shows a conceptual layout of a eTRU port which will be installed at the distribution service center in Tracy, CA.

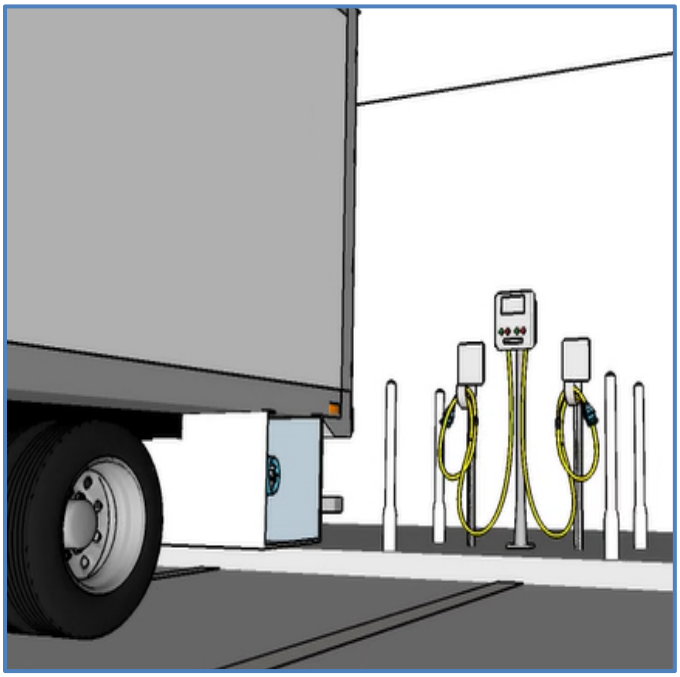

Figure 8: Conceptual layout of eTRU port.

Figure 9 below shows the proposed design of the 25 eTRU ports which will be installed at the distribution service center in Tracy, CA. As described in the Project Description Section, 10 of these eTRU ports will be installed in the staging area while the other 15 will be installed at loading docks where the perishable goods are loaded. The staging area will provide both pre-cooling prior to loading and cooling for any storage that is necessary prior to departing the distribution center.

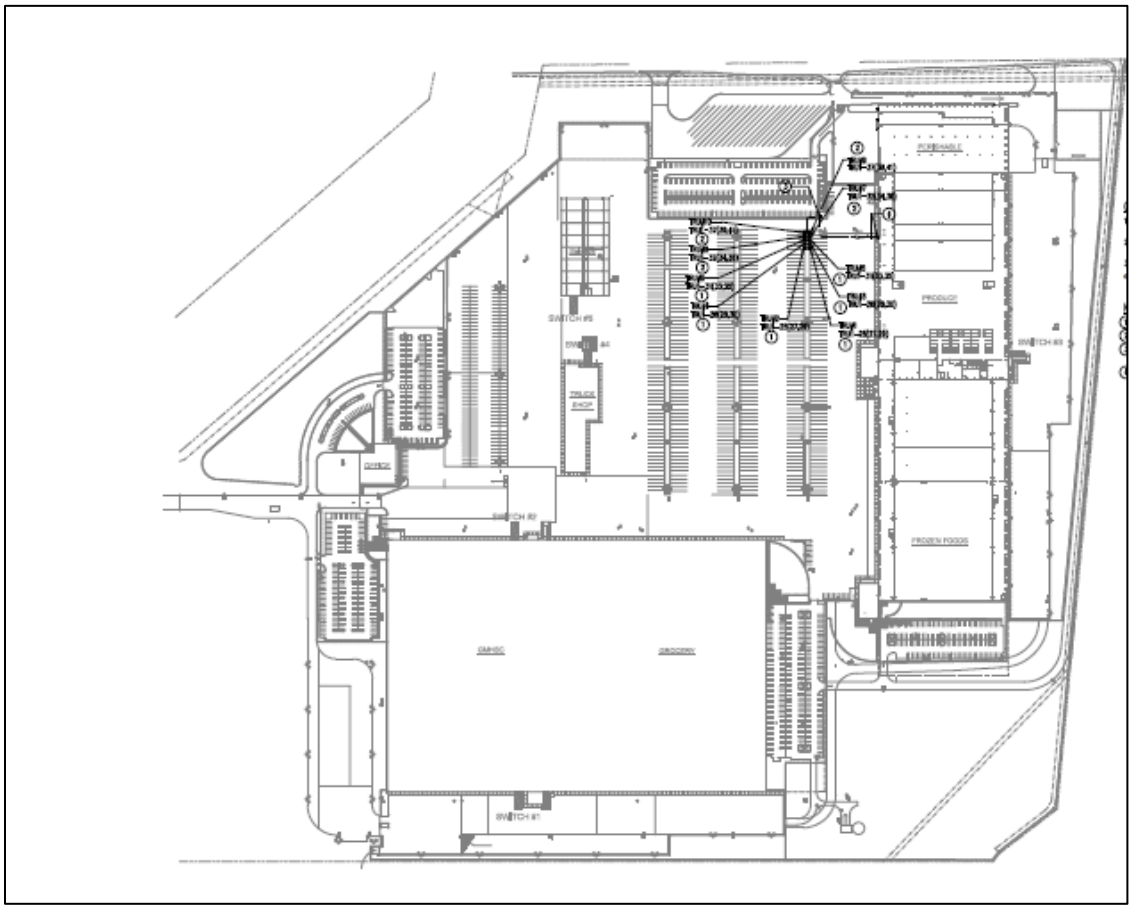

Figure 9: Albertson's facility showing location and placement of eTRU ports.

Barriers to Participation

Overall the most significant barrier to participation in this pilot is the nascent state of the eTRU market. While eTRUs have been widely used fueled by diesel, there is minimal evidence of eTRUs fueled with electricity. Food distributors are not knowledgeable about how eTRUs can be fueled with electricity nor is there a robust market for charging infrastructure for this sector. The state of the eTRU charging market created additional difficulty in implementing the pilot.

As described in the Customer outreach section, small and medium business owners often did not have the resources to dedicate to scoping and implementing this pilot. This limited participation to larger businesses that had resources to support the implementation of the pilot. After narrowing down to two larger customers, one the customers interested in participating in provided additional complexity due to their unique business model. The customer owned and operated a distribution facility however did not own the vehicles that utilized the distribution facility. In this example, multiple food distributors leverage the distribution center and would be required to have a payment mechanism implemented for each eTRU port. In addition to the

payment mechanism, it would be necessary to work with each of the food distributors to ensure they modify each of their eTRUs to allow for them to be plugged into the charging port. Ultimately, it was decided that going with Albertsons would be a simpler installation for the pilot because Albertsons owned the entire supply chain (trucks, and facility).

Disadvantaged Community Participation

DAC participation was the first filter used to select a partner for this project. Albertson's Distribution center is in a DAC[6].

2. Costs

Program Budget

Table 9: Idle Reduction Pilot Budget shown with 2018 Actuals

Project Cost Category	2018 Actual	2019 Projected	Totals
Expense Cost			
Utility-Side Make-Ready	$ -	$ 59,400	$ 59,400
Customer-Side Make-Ready	$ -	$ 115,000	$ 115,000
Construction Project Management	$ -	$ 250,000	$ 250,000
Energy Storage/Charge Management	$ -	$ 450,000	$ 450,000
Program Project Management	$ 33,916	$ 91,084	$ 125,000
Purchased & Self Developed Software	$ -	$ 400,000	$ 400,000
Measurement & Evaluation	$ -	$ 100,000	$ 100,000
Outreach and Engagement	$ -	$ 100,000	$ 100,000
Charger Incentives		$ 120,000	$ 120,000
Make Ready O&M	$ -		$ -
Total Cost	**$ 33,916**	**$ 1,685,484**	**$ 1,719,400**

Full project costs have not been recorded at this time. There have been no significant variances or deviations from the forecasted cost.

Description of Leveraged Funding

PG&E is not aware of any additional funding that was used to purchase any infrastructure or vehicles that Albertsons used.

3. Safety

While construction has not yet begun Albertsons and Hanson Rice in consultation with PG&E and will do the following:

- The Contractor is required to provide a Site-Specific Safety Plan.

[6] *Received percentile rating greater than or equal to 64.63% per Cal Enviro Screen 3.0*

- Contractors are required to follow all OSHA safety requirements and all requirements outlined in the SB 350 Safety Check-List before, during, and after construction.
- Albertsons has a duty to promptly notify PG&E when Albertsons becomes aware of any unsafe, inoperable or damaged equipment.
- All parties shall comply with all applicable federal, state, and local statutes, rules, regulations, laws, orders and decisions that relate to or govern its participation in the SB 350 Priority Review Projects and/or Albertsons interactions with customers in connection with the SB 350 Priority Review Projects

Construction has not started yet and there have been no safety issues to date.

4. Lessons Learned

Table 10: Lessons Learned for the Idle Reduction Pilot

Category	Issue	Lessons Learned/Recommendations
Customer Acquisition	Small/medium customers lacked resources to participate in Idle Reduction pilot.	Streamline processes and create customer education materials to support small/medium customer participation in EV Fleet Program
Customer Acquisition/Construction	Food distribution centers explored in the pilot were transmission or primary service customers making it difficult for PG&E to own and operate charging infrastructure.	Enable customer participation in EV Fleet by simplifying the customer owned infrastructure rebate option by straight forward rebate amount per eTRU port.
Charging Equipment	Nascent eTRU charging infrastructure market with few products available.	Work with eTRU manufacturers to coordinate with charging vendors to develop a charging standard. Syndicate lessons learned from pilot to encourage food distributors to adopt eTRU charging technology.

D. Home Charger Resource Pilot

1. Project Description and Background

Project Goals

The goal of the Home Charger Information Resource Project is to remove barriers for residential customers to install home charger stations and accelerate transportation electrification throughout PG&E's territory.

The pilot consists of two phases described below.

Phase 1: Website Update and Development of Check-list:

This phase of the project focuses on providing information resources to educate customers on EV charging and the process to install a home charging station. PG&E's EV residential charging webpage will undergo a complete review to remove outdated information and duplicative content to other external resources. New content will be created as needed to inform customers of the residential EV charger installation process. PG&E will also make updates to its website to increase accessibility to customers by translating key pages to Spanish and Chinese. PG&E will analyze click-through rates to determine which pages are most visited and should be prioritized in this effort. Additionally, a checklist will be created to inform customers of the important criteria to consider when searching for an Electric Vehicle Supply Equipment (EVSE, or charger) model and contractors. This checklist will be translated as well.

Phase 2: Self-Service Installation Tool:

This phase of the Home Charger Information Resource Project includes launching a customer-facing self-service Installer Tool that will actively support customers in procuring EVSE installation and O&M services.

The Installer Tool will be web based and support customers in their journey to EV adoption by addressing the following:

- empower customers to act, take photos, get quotes, communicate with qualified contractors, and minimize time spent meeting with contractors;
- all-out the best contractors with an objective, quality scoring framework;
- make all content available in Spanish, and when needed, connect English as a second language (ESL) customers with contractors that speak their primary language, and;
- promote small, minority, women, and disabled veteran-owned businesses.

Procedural/Regulatory History

On January 11, 2018, the Commission issued D. 18-01-024, which approved with modifications the Home Charger Information Resource Pilot with an authorized budget capped at $500,000. The decision directed PG&E to focus this modified budget to build-out its current webpages to maximize

outreach of its website to individuals living in DACs and to develop checklists to inform customers of the important criteria to consider when searching for an Electric Vehicle Supply Equipment model and contractors. The revised direction incorporated feedback from stakeholders and focused the pilot on information resources for residential customers, including DAC customers, instead of creating a new list of commercially available EVSE or an online marketplace. The reduced budget also serves as assurance that these efforts will not duplicate existing external resources.

With the proposed budget, PG&E also committed to an additional task of creating a tool to connect customers to qualified contractions to bridge the gap between informing the customer and enabling the installation of a home charger.

Implementation Timeline and Key milestones

After refreshing the web content, launching a home charger installation checklist, and translating the content into Chinese and Spanish, PG&E will begin Phase 2 to deploy and develop a Home Charging Installer Tool with a third-party vendor. PG&E intends to be in contract with a vendor by Q2 2019 and the tool is estimated to be available by Q3 2019. Once available, the tool will operate for two years as PG&E collects usage data and determines the value of sustaining the tool past the pilot end date.

Summary of Project Milestones:

- Web content/Checklist live and translated: February 2019
- Phase 2 procurement and contracting: Q2 2019
- Charging Installer Tool live: Q3 2019
- Project Completion and Reporting: Q3 2021

Description of Project Status

Phase 1 is nearly complete. The proposed timeline for completing Phase 1 was approximately 3 months.

To date the following milestones have been accomplished:

- PG&E web content has been reviewed and outdated content has been removed
- Checklist has been created[7]
- Since launch the page has received 1,452 visits[8]

Translation of the web content and checklist into Spanish and Chinese are in progress and will be live in February 2019. Phase 2 of the project is ongoing. PG&E will select a vendor through a

[7] https://www.pge.com/en_US/residential/solar-and-vehicles/options/clean-vehicles/electric/charger-installation.page

[8] As of 01/11/2019

procurement process for the development of the Charging Installer Tool and will go into contract with that vendor by Q2 2019.

2. Project Participants

PG&E's webpages are open to all customers. Our efforts to translate high-traffic pages to Spanish and Chinese will benefit a diverse subset of customers. In addition to translating content, the translated pages will also emphasize information that is especially applicable to these customers, such as incentives. PG&E will also partner with external entities who have experience serving these communities to adapt and refine targeted outreach efforts.

The charger installation tool will incorporate many features that will serve the needs of DAC customers. The mobile functionality will allow for data collection without requiring customers to have a sophisticated understanding of EV chargers or their home electric infrastructure (e.g. utility panel). Customers will not have to stay home for multiple contractor site visits and project scoping sessions. Customers will schedule one installation visit at a time most convenient for them. This is especially valuable for low-income customers who may struggle to take time away from work.

In addition to tracking performance and credentials, the Installer Tool will also track the Diverse Business Enterprises (DBEs) status of participating vendors. PG&E proposes to display the DBE status of businesses to customers when selecting vendors.

3. Costs –

Program Budget

Table 11: Home Charger Resources Pilot Budget shown with 2018 Actuals

Project Cost Category	2018 Actual	2019 Projected	2020 Projected	Totals
Expense Cost				
Website Update	$ 179	$ 22,696	$ 16,500	$ 39,375
DAC Marketing and Outreach	$ -	$ 33,000	$ 33,000	$ 66,000
Charging Installer Tool Startup Costs	$ 213	$ 109,787	$ -	$ 110,000
Charging Installer Tool O&M	$ -	$ 44,000	$ 44,000	$ 88,000
Charging Installer Tool Marketing and Outreach	$ -	$ 33,000	$ 33,000	$ 66,000
PG&E Project Management	$ 161	$ 68,589	$ 34,375	$ 103,125
Final Report	$ -	$ -	$ 27,500	$ 27,500
Total Cost	**$ 553**	**$ 311,072**	**$ 188,375**	**$ 500,000**

The table above outlines the project budget filed to the Commission along with actual cost to-date.

4. Safety

There are no safety updates to report at this time.

5. Lessons Learned

Given this project is still in its early stages, there are no major lessons learned to report.